WHAT IS CLAIMED IS:

1. An apparatus for driving a liquid crystal display including a plurality of pixels arranged in a matrix, the apparatus comprising:

a data driver selecting data voltages from a plurality of gray voltages corresponding to image data representing at least a gray and applying the data voltages to the pixels; and

a signal controller supplying the image data to the data driver and generating digital gray data based on a distribution of the gray of the image data for a frame.

2. The apparatus of claim 1, wherein the apparatus further comprises a digital/analog converter converting the digital gray data from the signal controller into analog voltages and supplying the analog voltages to the data driver as the gray voltages.

3. The apparatus of claim 1, wherein each image data has a luminance data having a value, which is determined by the at least a gray represented by the image data and belong to one of a plurality of value sections, and the gray distribution is associated with the number of the image data belong to respective value sections.

4. The apparatus of claim 3, wherein each image data includes a set of image data portions for a predetermined number of respective colors, and the luminance data of the image data is defined as an average of the grays represented by the set of the image data portions forming the image data.

5. The apparatus of claim 3, wherein the signal controller comprises a gray voltage

generator reading out the image data for one frame, calculating the gray distribution of the image data, and modifying a standard gray voltage curve to obtain the digital gray data.

6. The apparatus of claim 5, wherein the gray voltage generator calculates the luminance data of the image data for one frame, calculates the number of the image data included in the value sections to obtain the gray distribution of the image data.

7. The apparatus of claim 6, wherein the gray voltage generator calculates a target gray voltage (VG_x') of each value section corresponding to the digital data voltage based on relations given by:

$$\Delta V_x' = \Delta V_x \cdot (1+K_x \cdot \Delta P_x) \text{ and } VG_x' = \Delta V_x' \cdot (\Sigma\Delta V / \Sigma\Delta V') + VG_{x-1},$$

where ΔV_x is a difference between a maximum gray voltage and a minimum gray voltage for the value section on the standard gray voltage curve, K_x is a weight value assigned to the section, ΔP_x is defined as $P_x-(AP)_x$, where P_x is a distribution probability for the value section and $(AP)_x$ is a distribution probability for maintaining the standard gray voltage curve, $\Sigma\Delta V$ is a sum of the differences (ΔV_x) between maximum gray voltages and minimum gray voltages for the respective value sections on the standard gray voltage curve, $\Sigma\Delta V'$ is a sum of $\Delta V_x'$, and VG_{x-1} is a maximum gray voltage of a previous value section in the standard gray voltage curve.

8. The apparatus of claim 7, wherein the weight value (K_x) for each section is determined as the value exhibiting the best visibility for the value section.

9. A method for driving a liquid crystal display, the method comprising:

reading out image data representing at least a gray for one frame;

calculating gray distribution of the read image data; and

modifying a standard gray voltage curve based on the calculated gray distribution to generate digital gray data.

10. The method of claim 9, wherein the gray distribution calculation comprises:

calculating luminance data of the image data based on the at least a gray represented by the image data; and

counting the number of the image data included in a plurality of sections of the luminance data.

11. The method of claim 10, wherein the digital data voltage (VG_x') is calculated based on relations given by:

$$\Delta V_x' = \Delta V_x (1+K_x \cdot \Delta P_x) \text{ and } VG_x' = \Delta V_x' \cdot (\Sigma\Delta V / \Sigma\Delta V') + VG_{x-1},$$

where ΔV_x is a difference between a maximum gray voltage and a minimum gray voltage for the value section on the standard gray voltage curve, K_x is a weight value assigned to the section, ΔP_x is defined as P_x-$(AP)_x$, where P_x is a distribution probability for the value section and $(AP)_x$ is a distribution probability for maintaining the standard gray voltage curve, $\Sigma\Delta V$ is a sum of the differences (ΔV_x) between maximum gray voltages and minimum gray voltages for the respective value sections on the standard gray voltage curve, $\Sigma\Delta V'$ is a sum of $\Delta V_x'$, and VG_{x-1} is a maximum gray voltage of a previous value section in the standard gray voltage curve.

12. The apparatus of claim 11, wherein the weight value (K_x) for each section is determined as the value exhibiting the best visibility for the value section.

13. The method of claim 10, wherein each image data includes a set of image data portions for a predetermined number of respective colors, and the luminance data of the image data is defined as an average of the grays represented by the set of the image data portions forming the image data.